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ESTHER AND AHASUERUS • CHARLES II EMBROIDERY

Gift of the Hearst Foundation

ESTHER IN MODERN DRESS

A Seventeenth Century *Embosted* Casket

Without two precious bywords, those who write about antiques could have told us very little about the *quaint* peasant arts of Europe, or the *amusing* folk arts of the Pennsylvania-dutch. Any country folk, especially those who (like the Amish) affect an unusual dress, or who go about minding their own business, are called "quaint" characters; and any of their artifacts that are gay, wrought by hand, and old or merely unfamiliar, are found "amusing."

Perhaps the overworking of these two stale words is unavoidable, even forgivable, where the homely products of unsophisticated craftsmen are concerned. But oddly, we find no better words to use here—where we tell of a class of work that belonged to the Court and to circles of aristocratic fashion. Surely in the fanciful and charming *embosted* (embossed) or "stumpwork" embroideries of the quarter-century reign of Charles II of England (1660-85) we discover the drollest scenes that ever were not meant to be funny!

Such is a needlework casket recently acquired by the Museum*—our first, and an excellent, example of this, highly "quaint and amusing" type of embroidery.

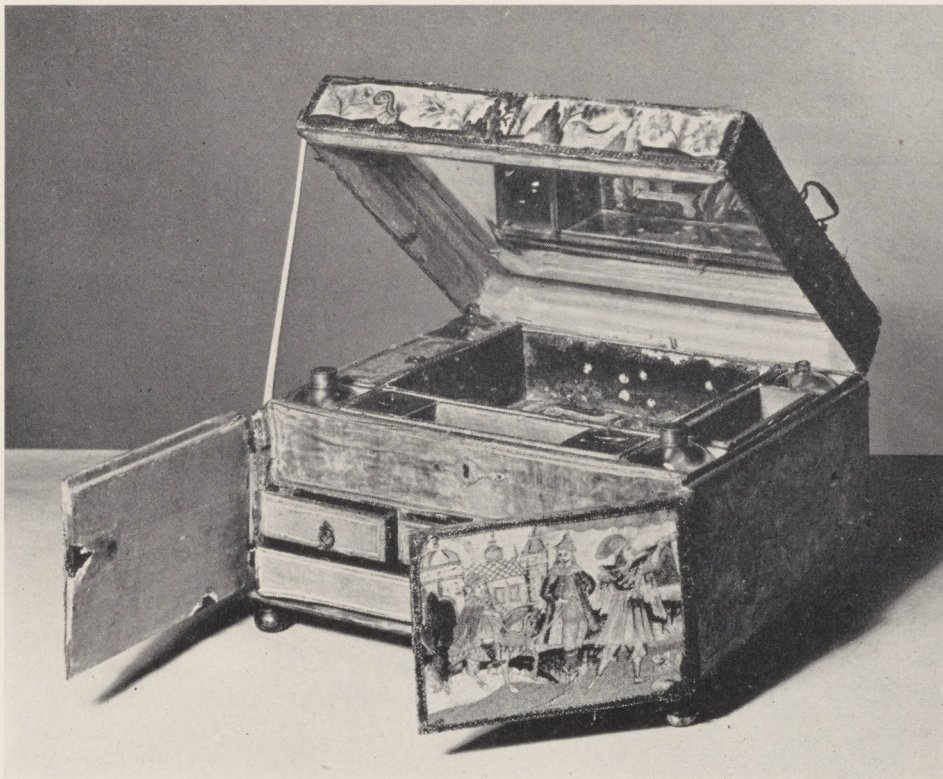
Coming after the sober magnificence of Tudor (16th century) needlecraft, and before the insufferable expanse of needlepoint upholstery that shrouded the five reigns to follow, these cheerful pieces well reflect the eccentric, pleasure-loving mood of their period. Only thirty when he gained the throne, and fairly spoilt by exile on the Continent since he was sixteen, Charles II himself set the example for what John Evelyn called (in understatement) "a politer way of living." If his sycophantic Court went to extremes, this was partly in reaction from the dour and dreary decade of the Commonwealth.

The art of needlecraft had been practised since ancient times, to be sure;† but it became particularly a vogue among ladies of the Court, and with women of fashion who followed their lead, from the reign of Henry VIII well into the period of the four Georges. The genteel accomplishment itself was mentioned everywhere in letters, and fine examples of work were given prominent notice in early wardrobe accounts and wills. Embroidery appeared in every article of apparel, from shoes to doublets and coifs, as well as in curtains and furniture covers, jewel caskets and mirror frames, book-covers or purses or pictures for the wall. When the great cotton *palampores* of India and Persia (printed or painted panels used for curtains and bedcovers) cost more than the silk used to line them, English ladies imitated their large floral designs in bright crewel embroidery. Or they embroidered dresses for themselves, and long waistcoats for their husbands, in lieu of the expensive brocades and velvets of Italy and France.

Catherine of Aragon, first queen of Henry VIII, had set a fashion for the handsome Spanish or "black" work—embroidery in black silk on white linen, enriched with gold and silver thread. Shortly thereafter (June, 1520), the French fashion for richly wrought needlecraft was brought to England following the tournament of the Field of the Cloth

*Accession number A.5141-102, a gift of the Hearst Foundation. Size 11 by 14 inches, height 8 inches. Purchased from a private source, descendants of the maker.

†A famous example is the Bayeux "tapestry," which is really an embroidery, with a vast 231-foot panorama of scenes from the Norman Conquest. Its authorship, though in some dispute, has traditionally been given to Queen Matilda and her ladies, as early as 1066-87.



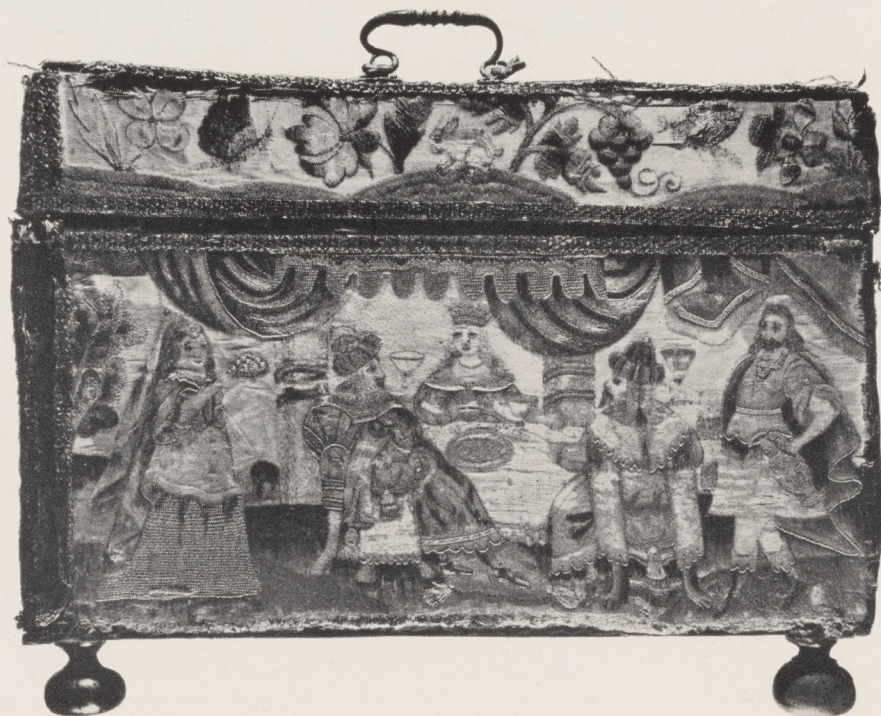
of Gold, where the chivalry of England under Henry VIII met the followers of Francis I. Here was a sumptuous and resplendent display of fabrics of every elaborated sort, the arms and apparel of the nobles themselves scarcely excelling the fine trappings of their horses. As a small instance, the shoes (still in existence) that were worn by the English king were of red velvet heavily worked with gold-thread foliated arabesques, edged with gold braid, and finished with engraved silver plates encasing the soles and heels.

With the introduction of the fine steel needle (from India, about 1545), Tudor stitchery became ever more complicated and refined. Caps and purses, sashes and gloves and other details of the costume were worked in silks and metal thread, with beads and spangles and pearls sewn in, either on a ground of solid needlework or on a plain velvet, with trimmings of gold or silver lace. Favorite was a pattern of bold scrolls enclosing flowers and animal figures, with perhaps monograms and the Tudor rose, crowns and the English lion.

We have only to recall the famous portraits of English monarchs to see how the Tudors surpassed all others in magnificence. Later kings and queens, even the expensive Charles II, were merely elegant—suffocating with silks, ambushed in great curled wigs, overfurnished with jewels. But Henry VIII and his daughter Elizabeth (whose reigns, taken together, account for most of the 16th century) are shown most wonderfully done up,

indeed so intricately bedizened that we must almost hunt through their portraits for the proud faces! Their sleeves are slashed and jeweled, their jackets stiff with needlework and strewn with pearls and spangles. Elizabeth's strong, sharp nose and dark, sharp eyes appear briefly under a cascade of jewels from her red-dyed hair and above a great embroidered ruff or a vast lace collar. Weighted with chains and ropes of pearls, apprehensively grasping a jeweled and feathered fan, she seems about to sink into her ballooning skirt of rich metal brocade.

After such excesses, the following half-century of the first two Stuart kings (James I, 1603-25 and Charles I, 1625-49) was a period of relatively temperate taste. The scrolls and brightness of Elizabeth's time gradually gave way to less robust and more naturalistic (albeit distorted) designs of animals and flowers, landscapes and portrait medallions. Tent-stitch (a fine all-over needlepoint) was in great favour, worked in pictures to hang on the wall or made up into fitted caskets, which constantly repeated the portraits of Charles I, the martyr king, and Henrietta Maria his queen. Book-covers were wrought in lavish and fragile *pasement*—a fabric of gold cord woven and plaited, knitted and crocheted, often with beads and spangles sewn in, and with raised lacework flowers in bullion and silks.



RIGHT END: *Abasuerus and Haman at the Feast Prepared by Esther.*

Stumpwork or *Embossed* stitchery, as it was called, now made its first appearance. In a picture-embroidery with landscape and figures, on a satin ground strewn with flowers and beasts and often enriched with seed pearls and sequins, the principal figures or background details were brought forward in high relief. These were embroidered over small wooden forms, or built of metal thread sewn over padding, or fashioned of satin stuffed with bits of fabric and cotton-wool. Features of a face might be painted on the satin, with real hair used for the coiffure, seed pearls and scraps of fine lace for the necklace and collar, and tiny hands of carved wood. Shaggy masses of French knots formed the mane of a lion or the bodies of lambs larger than the lions. An infinite variety of stitches gave liveliness of texture, for the pattern and draping of costumes and curtains, for the soft roundness of fruits and flowers, or for the contrast of stone castles and soft-flowing streams—stitches called fern, nett, finny, Queen's, tent, fisher's, Spanish or Irish, satin, whip, gold and many another that cannot now be identified by name.

Heraldic designs were much used, as they had been before. But the outstanding work was in representation of allegorical, mythological and Biblical scenes: Orpheus and the Beasts, Adam and Eve, King Solomon and the Queen of Sheba, the Judgment of Solomon, or Abraham and Isaac. The wide popularity of certain subjects, and the reappearance of certain figures or details again and again, suggests that such work was copied or adapted



LEFT END: *The Hanging of Haman on the Gallows Prepared for Mordecai.*

from books of engravings or from pattern-books of designs for needleworkers. Occasionally we can trace the origin of a design to some contemporary herbal, or illustrated Latin text.

Stumpwork of the Charles II period carried this fashion trend to wonderful heights of whimsy. It showed the most exquisite of stitchery, and employed a congeries of every imaginable material. The castles that appeared in almost every scene were given tiny windows glassed with mica; and patches of mica were used, with fine effect, to overlay the pretty designs of little lakes and flowing streams. Peacock feather was worked into the embroidery, and fragments of ivory or pearl, silver and gold foil or real fur. Sheep were now represented not in bumpy French knots, but with actual tufts of wool. Draperies and lambrequins were shown in Gobelin stitch or the finest of cut pile, and finished with tiny loose tassels.

Of such work is our own casket, *circa* 1660-70, picturing the New Testament story of Esther and Ahasuerus. *Embossed* in soft colours and gold on an ivory satin, it suggests our present-day "Shakespeare in modern dress"—the characters here wearing costumes of the 17th century, and performing in landscapes furnished with Renaissance castles and with the flowers and creatures of the English countryside. We must sometimes be in doubt about these scenes with Royal couples, since 17th century dress is used in all or most of them. Some, lettered CR for Charles Rex, of course represent Charles II. But Solomon and the Queen of Sheba (as most of them are now called) are shown really no different in appearance. With our own example there is no uncertainty, for six picture-panels here tell the complete story of Esther.

On the back of the box, Esther and her foster-father Mordecai arrive in Shushan at the palace of Ahasuerus, King of the Medes and the Persians, where they are met by Hegai. The cover shows Esther as the Queen, suppliant to Ahasuerus—proposing the banquet where she will expose the proud Haman's treachery to the Jews (see *Front Cover*). The banquet scene itself, with the King and Esther, Haman and two attendants, appears on the right hand panel. Mordecai at the gates, and the honoring of Mordecai in a procession with trumpeting herald, are pictured on the two doors of the casket. And on the left panel is the hanging of the wicked Haman on the gallows he had prepared for Mordecai. Following the four sides of the lid is a typical border of flowers, thistles and grapes, and an odd company of animals, all drawn without regard for their proper sizes. Moths and snails are shown as large as the rabbit or rooster, and a squirrel and a smiling fish no larger than the butterflies.

The work and fitments of the wooden case itself would appear to be by the same hand as a needlepoint casket dated 1657, in the Museum of Fine Arts, Boston.* Lined with pink silk and plush, edged with silver braid, and with fine gilt-brass and silvered hardware, it contains exposed and secret drawers arranged for jewels. A lid with a looking-glass gives access to a series of pockets and boxes surrounding a mirrored well; and there are such toilet and writing requisites as four pewter-capped square bottles of paper-thin glass, and an inkwell and pounce-box of engraved and silvered brass.

Exhibited briefly in the gallery of Recent Accessions, our casket has now found a permanent place in the English Silver gallery on the second floor. Here it appears in near company with fine examples of silverwork belonging to its own period.

—GREGOR NORMAN-WILCOX

*See p. 181 in *Antiques* for April 1944. Also, compare an embroidered workbox of 1672, shown pp. 153-6 in the *Connoisseur* for March 1921.

CALIFORNIA'S FLIGHTLESS BIRDS

Flightless birds—those nonconformists of the feathered fraternity which have relinquished their freedom in the air—are a rarity in the world today. Out of a total of 25,000 known members of the avian class, there are but thirty-five which cannot fly. These are to be found only in the southern continents and neighboring islands. Since the extinction of the Great Auk of the North Atlantic, about a hundred years ago, no flightless birds have been known in North America.

In past geologic ages, however, four groups of such birds lived within the region which today we call the United States. One, a gigantic, ostrichlike creature named *Diatryma*, pursued its short destiny over the areas of Wyoming and New Mexico some fifty million years ago. Another, recorded by the name of *Hesperornis*, lived in the shallow seas which, over a hundred million years ago, covered certain interior areas of this country. *Hesperornis*, unlike the terrestrial *Diatryma*, was not a running bird, but was highly specialized for swimming and diving.

The remaining two North American flightless birds of the past appear to have been peculiar to the west coast, for their fossil remains are found only in southern California. These too, like *Hesperornis*, were aquatic birds, but their structural modifications for this type of life were less extreme.

A single upper wing bone of one of these was the first fossil bird bone to be reported from California. It was discovered many years ago, during the excavation of the Third Street tunnel in Los Angeles, in a stratum assigned to the Pliocene epoch of geologic time (approximately 10 million years old). This bone showed the peculiar modifications associated with the use of the wing for swimming rather than flying, though the particular characteristics were different than in any other known bird. On the basis of this single specimen, therefore, the species *Mancalla californiensis* was described, in 1901, by Frederick Lucas, one of the pioneer students of fossil birds.

Many other fossil birds have been found and described since Lucas' report, but it was not until 1937 that another specimen of *Mancalla* came to light—this time in San Diego. A third locality for this unusual bird was discovered last summer by a party from the Los Angeles County Museum exploring in the vicinity of Newport Bay. And at the same time still more specimens were found in San Diego.

Fitting together the various bits of information now available on this interesting bird of California's past, we can begin to visualize *Mancalla* more clearly in comparison with better known birds of parallel structure.

The two main groups of flightless birds which use their wings in swimming are the Great Auk, or Garefowl, of the north, whose extinction was previously mentioned, and the penguins of the Antarctic. These birds, although unable to use their wings in aerial flight, can be said to "fly" under water. The wing bones are flattened and shortened so that the wings become flipperlike. This condition is most marked in the penguins, in which even the feathers are short and scalelike, and the lowermost bones of the wing have become short, flat, shapeless blades. The modifications were less exaggerated in the Great Auk, and the feathers were more normal in appearance, though the wing was only about half the size which would have been required to carry the bird through the air. The feet are webbed in both groups, but are stubby and well padded in the penguins,

longer in the Garefowl. The latter probably used its feet, as well as its wings, in swimming and diving; the penguin, on the other hand, keeps its feet straight out behind as it swims entirely with its wings. On land these birds are strongly handicapped, the short legs and erectly posed body producing a waddling gait. The penguins, ridiculous as their ambulations appear, can nevertheless travel at a fairly rapid gait on land, and are good jumpers. It is doubtful if the Garefowl, whose legs though longer were less sturdy, was as capable.



MANCALLA

The wing structure of Mancalla shows the same flattening and shortening of the bones which characterize the latter forms. In degree of specialization it is actually intermediate between the Great Auk and the penguins, the modifications of the wing bones being more exaggerated than in the former, but less marked than in the latter. The bird was smaller than the Great Auk, standing possibly about a foot in height. The legs were short but slender as in the auk, not broad and squatty as in the penguins. In fact, in spite of the greater specialization of the wings, the actual relationships of Mancalla are clearly close to the auks, and the bird should probably be assigned to the same suborder at least. It cannot, however, be considered ancestral to the Garefowl, as its skeletal modifications had passed the point where there could have been any possibility of reconversion to the condition found in that bird. The idea of ancestry to the penguins is even more untenable. Not only does the penguin group stand widely apart from all other orders of birds, but fossil penguins from even earlier ages than that in which Mancalla lived show practically the same degree of wing specialization as do the living penguins.

We may say of Mancalla, then, that it was an auk-like bird of medium size, highly specialized for aquatic rather than aerial navigation; that it was apparently peculiar to the shores of California; and that it died out, leaving no descendants, several million years before there were ornithologists on earth to experience the thrill of its discovery.

The second of California's flightless birds appeared at a somewhat later time—toward the latter part of the glacial age, or Pleistocene epoch, fifty to a hundred thousand years ago. It seems to have been quite abundant, but for some reason it became extinct before historic time, probably even before aboriginal man set foot on western soil.

The history of the accumulation of information on this bird is an interesting one. It dates back about twenty-seven years to the discovery, in Santa Monica canyon, of two

fossil leg bones showing great similarity to certain of the diving ducks (the Surf Scoter) but almost twice as large. Professor Loye Miller, of the University of California, after studying the bones, realized that they represented a bird heretofore unknown, and erected the species *Chendytes lawi* to contain them. Because of its size the bird was commonly referred to as "Law's Diving Goose." Since Miller's description in 1925, bones of this "diving goose" have been recognized in practically every marine Pleistocene deposit of southern California in which any bird remains were found. Additional specimens were taken from Santa Monica, and explorations at San Pedro, Playa del Rey, Los Angeles, and in Ventura county have all yielded bones assignable to this bird. But in every case the bones found were leg or pelvic bones—never a wing bone, breastbone, or portion of shoulder assembly. The disproportionate occurrence of leg elements, particularly as these appeared in some numbers, finally gave rise to the suspicion that the wing elements of *Chendytes* must have been degenerate—possibly entirely absent, or, more likely, small and fragile and thus not as readily preserved as the large, sturdy hind limb bones.

With this thought in mind, the bird remains from all Pleistocene marine localities in southern California were reviewed, and even the smallest slivers examined carefully.



CHENDYTES

Among the specimens from Playa del Rey a fragment of shoulder girdle was found which gave evidence of degeneration and seemed to show characters relating it to the ducks. But the bone was too fragmentary to base any conclusions upon it.

Throughout 1946 the Museum's field party, collecting in the Newport Bay region, brought in a number of bird bones from a Pleistocene locality near the site from which bones of the earlier Mancalla had been taken. Among the first of these Pleistocene specimens were several leg bones of *Chendytes*, but though wing bones of other birds were found, none appeared which could be assigned to the "diving goose." However, the bird was so well represented by leg elements, and the work of excavation was being carried on so meticulously, it was only a question of time before the wing elements should appear, if they had ever been present. It was not a complete surprise, therefore, when in the late fall, two fragile wing specimens were discovered. One is of the same portion of the shoulder assembly represented by the fragment from Playa del Rey, and is structurally similar.

The Newport specimen, however, is better preserved and, in spite of its small size and other signs of degeneration, its relationship to Chendytes cannot be doubted. The other specimen is an upper wing bone scarcely larger than that of a Ruddy Duck, and markedly atrophied. Although, owing to its greater degeneration, the wing bone does not exhibit the definite characteristics relating it to the diving ducks which are evident in the shoulder element, its assignment to Chendytes can hardly be questioned.

Though no skull, breastbone or lower wing bones of Chendytes have yet been found, it is now possible to form some sort of picture of the bird. Probably it had an over all length of 2 to 2½ feet. And we judge that it looked like a huge scoter duck, possibly even exhibiting the swollen area at the base of the bill which characterizes most of the modern scoters. The large, strong legs were placed far back on the body, which, as in many aquatic birds, produces greatest efficiency in swimming but presents a handicap when walking on land. The entire propelling power of Chendytes was concentrated in the legs. The wings, of course, were very small, and would have functioned, if at all, only as aids in balance. It is impossible to say with assurance that they bore even rudimentary flight feathers. It is likely that they did, and that the wings were thus observable from the exterior, but this cannot be determined until something is known of the lower wing bones to which the flight feathers attach.



MANCALLA (*Left*) AND CHENDYTES (*Right*).

Among living birds the only species which parallels Chendytes is the flightless Harris Cormorant of the Galapagos Islands. In this bird, too, the wings are small, though their atrophy has not reached as advanced a stage as that noted for the fossil bird.

Contrasting Chendytes with Mancalla, we find that these birds represent the two extremes of flightlessness associated with adaptation to aquatic life. They are obviously independent of each other. It would be impossible for the earlier Mancalla with its flattened, yet sturdily constructed, paddlelike wings and comparatively weak foot and leg structure, to have given rise to the heavy-legged, weak-winged Chendytes which inhabited the same area less than a million years ago. Presumably, over a long period of time, this area afforded protection from predatory creatures. Both species, then, at different times and in different ways, were able to overspecialize their swimming mechanism at the expense of flying. In Mancalla the loss of the function of the wing for flight was directly associated with its conversion into a superefficient paddle. In Chendytes the deterioration of the wing mechanism was presumably secondary to the development of aquatic capabilities. We may postulate that the hind quarters became overdeveloped with respect to the fore quarters, until the wings, no longer capable of lifting the body, lost all semblance of their former power.

It is curious that, except for the penguins, almost nothing is known of the ancestry of any flightless birds. Each species has appeared without antecedents, and the fossil forms have disappeared without progeny. Even in the penguins the modifications observed from the earliest to the latest forms (an evolutionary span of at least thirty million years) are so slight that they merely serve to indicate the tremendous period of time which must have elapsed in the entire course of their development. We must, therefore, lay our hopes upon the discovery of very much earlier types to reveal the course which nature has followed in producing these anomalies.

—HILDEGARDE HOWARD

Illustrations by Arminta Neal



TYPICAL JOSHUA TREE COUNTRY, NEAR LITTLE ROCK.

GIANT LILIES OF THE DESERT

Giant lilies stretch their grotesque twisting stems forty feet skyward above the sun-baked desert sands . . .

That sentence sounds as though it were lifted bodily from *Gulliver's Travels* in Brobdingnag. Actually, it can be applied with scientific accuracy to almost any unspoiled section of the Joshua tree forest on the Mojave Desert.

The Joshua tree is by far the largest member of the lily family in California. It ranks, in fact, as the tallest *Yucca* in the world. Patriarchal examples may attain a height of thirty or even forty feet. Horlick¹ records an ancient specimen that was eighty feet tall, and estimates its age at one thousand years. An old tree which was growing fifteen miles east of Lancaster in 1925 was photographed by Ernest Braunton² and reported as being more than sixty-three feet high. But these very large examples are exceptional, and it is unlikely that any of them have been preserved. Thirty feet is given by Jepson as the maximum height. Trees of that size are conservatively estimated as about three hundred years old. That is quite a respectable age and stature for a lily.

Not only may the individual trees attain a venerable age, but the tree yuccas as a group can boast of an ancient lineage.

¹Journ. N. Y. Bot. Gard. 33:249, 1932.

²Journ. Int. Gard. Club. 3:567, 1919.

The giant ground-sloths which ranged the desert valleys and coastal plains of southern California during the glacial (Pleistocene) period made use of the yuccas as food. The excavations made by M. R. Harrington and associates at Gypsum Cave, Nevada, as reported in No. 8 of the *Southwest Museum Papers*, brought to light considerable coprolite of the lesser ground-sloth (*Nothrotherium*). Lauder milk and Munz³ commenting on this, state that "the ground-sloth fed mainly on the Joshua-tree." Sloth dung recovered from Shelter Cave, New Mexico, by the Los Angeles County Museum, also gives evidence of the predominance of *Yucca* fibres, but in this case some other species of *Yucca* is probably involved.

John C. Fremont was apparently the first to write of the Joshua tree, if we exclude a brief mention in the diary of Capt. Pedro Fages. In Fremont's *Report*, under date of April 13th 1844, he tells of coming upon "yucca trees which gave a strange and southern character to the country." He was not favorably impressed with them, as he speaks of their "stiff and ungraceful form (which) makes them to the traveller the most repulsive tree in the vegetable kingdom." Probably his reaction was colored by the hardships which he and his party had to endure while crossing their desert domain.



YUCCA SPROUT, SHOWING CONE FORMED BY THE YUCCA-BORER.

Most desert devotees would resent his epithet of "repulsive." Weird and grotesque the Joshua tree may be, but with a wild beauty all its own, and a strength that typifies defiance of the driving sandstorms and scorching winds of its habitat.

This giant lily, technically known as *Yucca brevifolia* Engelm., is an outstanding example of perfect adaptation to a hostile, arid environment. It can withstand the biting cold

³Cont. to Paleont., IV, Carnegie Inst. Publ. No. 453, 1934.

Sierran winds in winter, and the searing summer blasts. It can aestivate, and conserve its stored moisture through several years of drought, sealing all its exposed surfaces against evaporation, and then in the brief visitation of a rain can put forth its succulent multi-flowered blooms in great abundance, sprouting its tender offspring from a network of underground runners. It can hold its own against the external gnawing of rodents and ruminants, and the internal chewing of innumerable larvae. About the only ravages it is unable to withstand are those of the real estate operator and subdivider, and of the commercial exploiter. When man moves into the Joshua tree domain and begins his feeble attempt to make "the desert rejoice and blossom as the rose," the Joshua tree moves out, never to return.

The greater part of the range of *Yucca brevifolia* is on land unsuited to agriculture. Unfortunately, man has to learn this the hard way, by trial and failure. One has only to travel over parts of the Mojave Desert today and note the areas of barren soil and blowing sand, where once the ground was held by the roots of the creosote bush and Joshua tree, to realize how stark and sinister this failure really is.

Nature maintains her system of checks and balances on the desert, as elsewhere. The chief factor holding the spread of the Joshua tree in check is the larva of a large skipper butterfly known technically as *Megathymus yuccae navajo* Skinner, and commonly designated the Navajo Skipper or the Navajo Yucca-borer.

This larva starts its career in the tip of a year-old or two-year-old sprout which is attached to one of the long subsurface roots or runners. The tiny worm burrows down through the shoot and into the root, keeping open the channel through which it has descended. This channel is traversed daily in the interest of sanitation, for the larva never allows its burrow to become soiled.

The rate of growth of this larva is slow. It takes nearly a year to mature. It begins its burrowing usually in March, just after it has hatched from the egg. As it works downward towards the root, the shoot turns yellow and begins to die.



CHRYSALIS OF MEGATHYMUS YUCCAE NAVAJO.

When the heat of summer develops, the larva is working well underground in the succulent pith of the runner where it is well protected from heat and dehydration. By this time it has constructed a silken cone in the center of the now dead shoot, the upper end of which is sealed with a delicate mesh. This seal is broken only at the time the larva discards its frass, and is thereafter immediately repaired so as to keep out parasites and other unwelcome visitors.



LLOYD M. MARTIN, OF THE MUSEUM STAFF, DIGGING FOR YUCCA-BORERS.

By the beginning of winter the larva may have extended its burrow into the root for a distance of three or four feet. And as mid-winter approaches it becomes sluggish, having completed most of its feeding. In late January or early February it works back to the entrance of its burrow near the silken cone, where it changes to a pupa. During the short pupal stage it usually rests within the cone, but if disturbed it will drop back into the burrow.

The pupa hatches in March, and after mating, the butterfly starts in search of tender baby Joshua trees on which to lay its eggs.

Thus, for every *Megathymus* which matures, a baby Joshua tree is sacrificed.

Prior to 1934 *Megathymus yuccae navajo* was considered one of the rarest of North American butterflies. In August of that year Commander Dammers and the writer described its early stages,⁴ which opened the way for southern California entomologists to obtain the larvae and pupae, and to rear the species in numbers.

This is the only butterfly in California which is collected with a shovel. If you should be wandering among the Joshua trees in February and should chance upon a person toting a shovel and gazing intently on the ground under the Joshuas, very likely he's a member of our own Museum staff searching for the cones of the Navajo Yucca-borer. When he spots one, the dirt will be removed from around it so as to expose about a foot of the root. This is carefully opened at various points to locate the larva or pupa. Then the whole exposed portion of the plant will be removed, with the larva still in place within the cone or root as the case may be, and carried intact to the laboratory.

It is our opinion, based on years of observation, that the Joshua tree reproduces much more frequently from runners than it does from seed. Practically all of the tender young shoots growing close to older trees will be found to arise from runners that originate on the parent tree, close by. Infrequently, an isolated young tree will be found

⁴Bull. So. Calif. Acad. of Sciences, 33:(2) 87-92, 1934.

growing at some distance from a grove. When this occurs the tree has no root connection with other trees, and is obviously a seedling. These seedlings do not harbor the yucca-borer.

The fertilization of the Joshua tree blossom is brought about solely through the agency of a tiny moth, just as is the case with other species of Yuccas. The story of this intimate association and interdependence of moth and Yucca has been so frequently written that it is familiar to nearly every naturalist. Lloyd Mason Smith of the Palm Springs Museum gives an excellent account of it in the January 1947 issue of *Arizona Highways*. He uses the old familiar generic name of *Pronuba* for the moth, as have most writers ever since Prof. Riley first recorded it in 1873.⁵ Entomological authorities, however, have recently pointed out the fact that Zeller first recorded this genus under the name *Tegeticula*, which consequently has priority over *Pronuba*. Therefore, the correct scientific name of the Yucca moth which fertilizes the blossoms of the Joshua tree is *Tegeticula paradoxa* Riley.

Whatever its name, the important fact is that it could not exist without the Yucca, and in turn the Yucca would cease to exist without the ministrations of the moth.

—JOHN A. COMSTOCK

⁵5th Ann. Rep. Nox. & Benef. Ins. Mo. p. 150, 1873.

HOW OLD IS IT?

You can't tell the age of a "horseless carriage" by its teeth. There are many other ways, though, to arrive at the date of an early machine.

One's first thought is to look on the engine, for the serial number of an old car. But such numbers may not appear on the earlier models, as these frequently were made one at a time and each as a more or less individual project, with no expectation of building so many that model or serial numbers would be required. Then too, even if it has a number the car may be one of the nearly two thousand different makes of American-built trucks and passenger cars that have come and gone, many with scarcely a trace of their history left. Factory records may have been destroyed long since, or may be hidden away, beyond reach of the antiquarian who needs them to establish the date of his ancient machine.

Usually, the general pattern of the car will roughly indicate its period, but a student of *automobilia* (a word in accepted use) is not content with that. He wants to know the exact year his machine was built, or at least its year model (we remember that "1947 models" were being built in 1946).

One type has often misled the happy but too optimistic owner. This is the "high wheel buggy" type. A buggy was indeed the starting point for some of the first automobiles in this country. To the familiar buggy there was merely added a gasoline engine, with other features such as the clutch, transmission and steering gear. Even the whip socket might not be removed, for this could carry a whip to keep off a too annoying dog, or small boys trying to "hook" a ride. But these motor-equipped buggies soon gave way to more advanced styles, fundamentally designed as motor cars.

About ten years later, the Midwest farm trade called for a lighter and cheaper vehicle and the high wheel motor-buggy was back again. Doubtless many of the buggy and wagon makers had seen the writing on the wall, and wished to change to motor cars before the horse disappeared from the highway. The demand of the farm trade made it possible for them to switch to motor-buggies with just the addition of a motor and steering gear, and with not too much re-designing of their product as a whole.

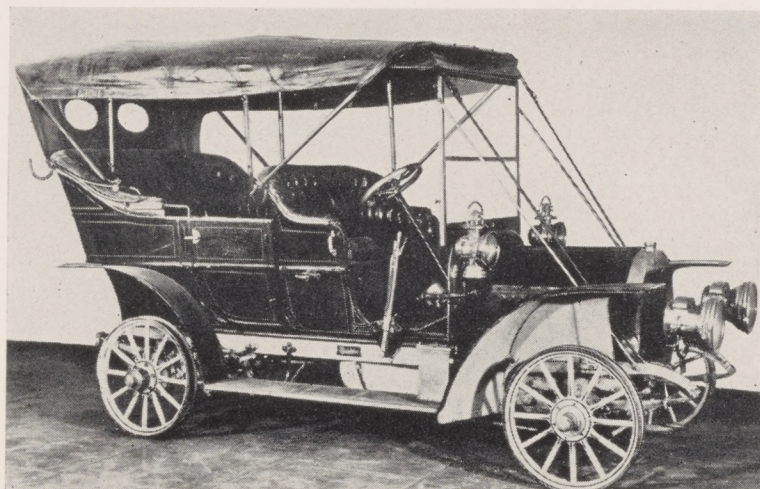
During the period about 1905-1912 many thousands of these power buggies, surreys and light trucks were marketed by Holsman, Schacht, Sears Roebuck & Company, Black, International Harvester Company and many others. The machines all had narrow tires, either solid or pneumatic. While practically all such vehicles belong to the years from 1905 (and very few were this early) to as late as 1912, their fond present-day owners now often brag of them as 1898 vintage models!

The accessories—lights, ignition system, carburetor, and the styles and sizes of wheels and tires—are often a guide in dating, but one must be wary of following such clues. Old cars were repaired, or brought up-to-date, with other types of equipment which may confuse and mislead the unknowing.

One car, an ancient Studebaker in the Museum collection, was found particularly hard to date, even though it appeared in an early catalogue in the writer's possession. As not uncommonly, the catalogue bore no date. Fortunately, however, an early owner of the car was located through the address on a quarter century-old envelope (containing rosin for the cone clutch) found in a door-pocket of the machine. From him we learned not only that ours is a 1907 car, but also that it had been the Studebaker "show car" at the San Francisco show in the spring of that year, and had sold for \$3750.

During the first decade of this century a large number of automobile manufacturers paid tribute to the Selden Patent.* Their cars all carried a small brass plate, with a serial number in the lower left corner, indicating that they were licensed under this patent. Our Studebaker has such a plate. Other cars can be roughly dated by comparing their Selden serial numbers with the numbers on cars of known date.

*The hold of the Selden Patent on the automobile industry was broken largely through Henry Ford, in 1911.



In California, the original registration number enables us to date machines that are earlier than 1914, as all California cars from those first registered in 1905 were in one continuous series until 1914 and were not required to be re-registered each year. Knowing its old number, we can find within what year a car was registered by referring to the State records. Before 1905 no cars were licensed; and since 1914 the annual changes of license number have made the numbers useless in establishing the date of a machine.

Sometimes when every such clew is unavailing, help is at last to be found from some experienced "old timer" wise in the relatively recent, yet already half-forgotten, lore of *automobilia*.

—RANSOM MATTHEWS

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